

AMENDMENTSIn the Claims:

Please substitute the claims as indicated below for the claims of the same number.

Claim 1 (Currently amended): An apparatus for treating tissue near a valve to modify flow through the valve, comprising:

a cinching member having a central region and at least two anchoring regions on opposing ends of the central region, wherein each anchoring region is configured to be anchored to opposing areas of tissue against or adjacent to an annulus of the valve and urge the areas of tissue towards one another;

the cinching member being further configured for delivery through a catheter to the tissue whereby the cinching member has a first shape during the delivery and a second shape after the delivery.

Claim 2 (Original): The apparatus of claim 1 wherein the tissue comprises an annulus of cardiac tissue surrounding the valve.

Claim 3 (Original): The apparatus of claim 1 wherein the valve comprises a cardiac valve.

Claim 4 (Original): The apparatus of claim 1 wherein the central region comprises a continuous alternating length.

Claim 5 (Original): The apparatus of claim 1 wherein each of the anchoring regions comprise a fastener.

Claim 6 (Original): The apparatus of claim 1 further comprising a plurality of additional cinching members, the cinching members being interwoven such that a plurality of spaces are defined therebetween in the second shape.

Claim 7 (Original): The apparatus of claim 1 further comprising a biocompatible fastener for attaching each of the anchoring regions to the tissue.

Claim 8 (Original): The apparatus of claim 7 wherein the biocompatible fastener comprises a distal end and a proximal end, the proximal end defining a projection for securing the anchoring region, and the distal end being configured for attachment to the tissue.

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cont.
Claim 9 (Original): The apparatus of claim 8 wherein the projection comprises an eyelet.

Claim 10 (Original): The apparatus of claim 8 wherein the anchoring region is secured to the projection via a mechanical fastener selected from the group consisting of sutures, adhesives, welds, hooks, and clips.

Claim 11 (Original): The apparatus of claim 8 wherein the distal end comprises a fixation device selected from the group consisting of sutures, adhesives, barbs, screws, pivoting locks, hooks, clips, and tags.

Claim 12 (Original): The apparatus of claim 1 wherein the cinching member is configured to approximate a portion of periphery defined by the valve, the central region comprising an arcuate length whereby each of the anchoring regions is in apposition to each other.

Claim 13 (Original): The apparatus of claim 12 wherein the portion of the periphery approximated by the cinching member comprises at least about 50%.

Claim 14 (Original): The apparatus of claim 13 wherein the portion of the periphery approximated by the cinching member comprises about 50% to 75%.

Claim 15 (Original): The apparatus of claim 12 wherein each of the anchoring regions is biased towards the central region.

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Claim 16 (Original): The apparatus of claim 1 wherein the cinching member comprises a biocompatible material selected from the group consisting of shape memory alloys and superelastic alloys.

Claim 17 (Original): The apparatus of claim 16 wherein the shape memory alloy comprises Nickel-Titanium alloy.

Claim 18 (Original): The apparatus of claim 1 wherein the cinching member is at least partially coated with a coating layer.

Claim 19 (Original): The apparatus of claim 18 wherein the coating layer comprises a therapeutic agent.

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Claim 20 (Original): The apparatus of claim 18 wherein the coating layer is hydrophilic.

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Claim 21 (Original): The apparatus of claim 19 wherein the therapeutic agent comprises an anti-thrombosis agent.

Claim 22 (Original): The apparatus of claim 18 wherein the coating layer comprises a radiopaque layer.

Claim 23 (Original): The apparatus of claim 22 wherein the radiopaque layer is selected from the group consisting of Nickel-Titanium alloy, Platinum, Palladium, Gold, and Tantalum.

Claim 24 (Original): The apparatus of claim 1 wherein the central region defines a first plane and the anchoring regions define a second plane, the second plane defining an angle relative to the first plane.

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cont.* Claim 25 (Original): The apparatus of claim 24 wherein the central region is configured to lie over a periphery of the valve.

Claim 26 (Original): The apparatus of claim 24 wherein the angle is about 60° to 120°.

Claim 27 (Original): The apparatus of claim 24 wherein the angle is about 90°.

Claim 28 (Original): The apparatus of claim 24 wherein the central region comprises a shape selected from the group consisting of semi-circles, arcs, half-ellipses, triangles, rectangles, and loops.

Claim 29 (Original): The apparatus of claim 1 wherein each of the anchoring regions are configured to pierce tissue.

Claim 30 (Original): The apparatus of claim 29 wherein each of the anchoring regions comprise a shape selected from the group consisting of semi-circles, triangles, arcs, half-ellipses, hooks, and V-shapes.

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Claim 31 (Original): The apparatus of claim 29 wherein each of the anchoring regions is selected from the group consisting of barbs, screws, pivoting locks, clips, and tags.

Claim 32 (Original): The apparatus of claim 1 wherein the first shape comprises a geometric shape selected from the group consisting of U shapes and V shapes.

Claim 33 (Original): The apparatus of claim 1 wherein the catheter comprises an elongate tubular member having a distal end and a proximal end with a lumen therebetween, the distal end defining a delivery port configured to pass the cinching member therethrough.

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Claim 34 (Original): The apparatus of claim 33 wherein the catheter further comprises a stylet having a distal end and a proximal end with a length therebetween, the stylet being slidably disposed in the lumen and being manipulatable from its proximal end.

Claim 35 (Original): The apparatus of claim 34 wherein the stylet distal end is angled.

Claim 36 (Original): The apparatus of claim 34 wherein the catheter further comprises a linear advancement mechanism connected to the proximal end of the stylet.

Claim 37 (Original): The apparatus of claim 36 wherein the linear advancement mechanism is selected from the group consisting of thumb-slides, screws, ratchets, and gears.

Claim 38 (Original): The apparatus of claim 33 wherein the catheter further comprises a radiopaque tip disposed on the distal end of the elongate tubular member.

Claim 39 (Original): The apparatus of claim 38 wherein the radiopaque tip comprises a metal selected from the group consisting of Nickel-Titanium alloy, Platinum, Palladium, Gold, and Tantalum.

Claim 40 (Original): The apparatus of claim 38 wherein the radiopaque tip defines a lumen therethrough in communication with the elongate tubular member.

Claim 41 (Original): The apparatus of claim 33 wherein the catheter further comprises a liner disposed in the lumen proximal of the distal end.

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Claim 42 (Original): The apparatus of claim 41 wherein the liner comprises a material selected from the group consisting of shape memory alloys and superelastic alloys.

Claim 43 (Original): The apparatus of claim 33 wherein the catheter further comprises a device disposed on the distal end, the device being selected from the group consisting of sensors and transducers.

Claim 44 (Original): The apparatus of claim 43 wherein the sensor is of a type selected from the group consisting of ultrasound sensors, Doppler, electrodes, and pressure sensors.

Claim 45 (Original): The apparatus of claim 43 wherein the transducer is configured to deliver energy of a type selected from the group consisting of RF, electrical, and heat energy.

Claim 46 (Original): The apparatus of claim 43 wherein the sensor is connected to a monitor.

Claim 47 (Currently amended) A method for treating tissue near a valve to modify flow through the valve, comprising:

providing a cinching member having a central region, a first anchoring region, and a second anchoring region, each of the anchoring regions being attached to opposing ends of the central region;

placing a delivery catheter near the tissue;

urging the cinching member through a distal opening defined in the catheter such that the first anchoring region exits the distal opening and attaches to a first area of the tissue against or adjacent to an annulus of the valve; and

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further urging the cinching member through the distal opening such that second anchoring region exits the distal opening and attaches to a second area of the tissue against or adjacent to the annulus of the valve such that the first area and the second area are urged towards one another by the cinching member.

Claim 48 (Original): The method of claim 47 wherein the tissue comprises an annulus of cardiac tissue surrounding the valve.

Claim 49 (Original): The method of claim 47 wherein the valve comprises a cardiac valve.

Claim 50 (Original): The method of claim 47 wherein providing a cinching member further comprises providing a plurality of additional cinching members.

Claim 51 (Original): The method of claim 47 further comprising providing a biocompatible fastener for attaching the first and the second anchoring regions to the first and the second areas of tissue.

Claim 52 (Original): The method of claim 51 wherein the biocompatible fastener is attached to the first and the second areas of tissue via a fixation device selected from the group consisting of sutures, adhesives, barbs, screws, pivoting locks, hooks, clips, and tags.

Claim 53 (Original): The method of claim 47 wherein the cinching member is comprised of a shape memory alloy.

Claim 54 (Original): The method of claim 53 wherein the shape memory alloy comprises Nickel-Titanium alloy.

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Claim 55 (Original): The method of claim 47 wherein the first anchoring region forms a shape configured for attachment to the first area of the tissue upon exiting the distal opening.

Claim 56 (Original): The method of claim 55 wherein the shape is selected from the group consisting of semi-circles, triangles, arcs, half-ellipses, hooks, and V-shapes.

Claim 57 (Original): The method of claim 47 wherein the second anchoring region forms a shape configured for attachment to the second area of the tissue upon exiting the distal opening.

Claim 58 (Original): The method of claim 57 wherein the shape is selected from the group consisting of semi-circles, triangles, arcs, half-ellipses, hooks, and V-shapes.

Claim 59 (Original): The method of claim 47 wherein the central region forms a shape selected from the group consisting of semi-circles, arcs, half-ellipses, triangles, rectangles, and loops.

Claim 60 (Original): The method of claim 47 further comprising forming a first plane defined by the central region and forming a second plane defined by the first and the second anchoring regions, the second plane defining an angle relative to the first plane.

Claim 61 (Original): The method of claim 60 wherein the angle is about 60° to 120°.

Claim 62 (Original): The method of claim 60 wherein the angle is about 90°.

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Claim 63 (Original): The method of claim 47 wherein the first anchoring region traverses the valve and attaches to the first area of the tissue located opposite of the delivery catheter.

Claim 64 (Original): The method of claim 47 wherein the second anchoring region attaches to the second area of the tissue located adjacent to the delivery catheter.

Claim 65 (Original): The method of claim 47 wherein the first area and the second area are located about 180° apart.

Claim 66 (Original): The method of claim 47 wherein urging the cinching member through the distal opening defined in the catheter comprises advancing a stylet having a distal end and a proximal end with a length therebetween through the delivery catheter to urge the cinching member.

Claim 67 (Original): The method of claim 66 wherein the stylet distal end is angled.

Claim 68 (Original): The method of claim 66 wherein the stylet is advanced by a linear advancement mechanism connected at the proximal end of the stylet.

Claim 69 (Original): The method of claim 68 wherein the linear advancement mechanism is selected from the group consisting of thumb-slides, screws, ratchets, and gears.

Claim 70 (Original): The method of claim 47 wherein placing the delivery catheter near the tissue comprises visualizing the delivery catheter via a radiopaque tip disposed on a distal end of the delivery catheter.

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Claim 71. (Original): The method of claim 70 wherein the radiopaque tip comprises a metal selected from the group consisting of Nickel-Titanium alloy, Platinum, Palladium, Gold, and Tantalum.

Claim 72 (Original): The method of claim 47 further comprising sensing the first area or the second area with a device disposed on a distal end of the delivery catheter, the device being selected from the group consisting of sensors and transducers.

Claim 73 (Original): The method of claim 72 wherein the sensor is of a type selected from the group consisting of ultrasound sensors, Doppler, electrodes, and pressure sensors.

Claim 74 (Original): The method of claim 47 further comprising delivering energy to the first area or the second area with a transducer disposed on a distal end of the delivery catheter.

Claim 75 (Original): The method of claim 74 wherein the energy is of a type selected from the group consisting of RF, electrical, and heat energy.

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Claim 76 (Previously amended): A system for treating tissue near a valve to modify flow through the valve, comprising:

a first catheter having a distal end region, the catheter being configured for transluminal delivery of the end region to the target site;

an end effector in communication with the distal end region, the end effector being configured to transfer energy to the tissue at the target site to induce thermal shrinkage of collagen in the tissue, thereby modifying flow through the valve; and

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a cinching member having a central region and at least two anchoring regions on opposing sides of the central region, wherein each anchoring region is configured to be anchored to opposing areas of tissue and urge the areas of tissue towards one another, the cinching member being further configured for delivery through the first catheter or a second catheter to the tissue whereby the cinching member has a first shape during the delivery and a second shape after the delivery.

Claim 77 (Original): The system of claim 76, wherein the tissue comprises an annulus of tissue surrounding a cardiac valve.

Claim 78 (Original): The system of claim 77, wherein modifying flow through the valve comprises reducing a circumference of the cardiac valve.

Claim 79 (Original): The system of claim 78, wherein the tissue comprises a support structure of a cardiac valve.

Claim 80. (Original): The system of claim 79, wherein the support structure is chosen from the group consisting of a chordae tendineae and a papillary muscle.

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Claim 81 (Original): The system of claim 80, wherein modifying flow through the valve comprises shortening the chordae tendineae to properly align leaflets of the valve.

Claim 82 (Original): The system of claim 76, wherein the tissue at the target site comprises a leaflet of a cardiac valve.

Claim 83 (Original): The system of claim 76 further comprising a plurality of additional cinching members, the cinching members being interwoven such that a plurality of spaces are defined therebetween in the second shape.

(31) Cont. Claim 84 (Original): The system of claim 76 further comprising a biocompatible fastener for attaching each of the anchoring regions to the tissue.

Claim 85 (Original): The system of claim 76 wherein the cinching member is configured to approximate a portion of periphery defined by the valve, the central region comprising an arcuate length whereby each of the anchoring regions is in apposition to each other.

Claim 86 (Original): The system of claim 85 wherein the portion of the periphery approximated by the cinching member comprises at least about 50%.

Claim 87 (Original): The system of claim 86 wherein the portion of the periphery approximated by the cinching member comprises about 50% to 75%.

Claim 88 (Original): The system of claim 85 wherein each of the anchoring regions is biased towards the central region.

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Claim 89 (Original): The system of claim 76 wherein the cinching member comprises a biocompatible material selected from the group consisting of shape memory alloys and superelastic alloys.

Claim 90 (Original): The system of claim 89 wherein the shape memory alloy comprises Nickel-Titanium alloy.

Claim 91 (Original): The system of claim 76 wherein the central region defines a first plane and the anchoring regions define a second plane, the second plane defining an angle relative to the first plane.

Claim 92 (Original): The system of claim 91 wherein the angle is about 60° to 120°.

Claim 93 (Original): The system of claim 91 wherein the angle is about 90°.

Claim 94 (Original): The system of claim 91 wherein the central region comprises a shape selected from the group consisting of semi-circles, arcs, half-ellipses, triangles, rectangles, and loops.

Claim 95 (Original): The system of claim 76 wherein each of the anchoring regions are configured to pierce the tissue.

Claim 96 (Original): The system of claim 95 wherein each of the anchoring regions comprise a shape selected from the group consisting of semi-circles, triangles, arcs, half-ellipses, hooks, and V-shapes.

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Claim 97 (Original): The apparatus of claim 95 wherein each of the anchoring regions is selected from the group consisting of barbs, screws, pivoting locks, clips, and tags.

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